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ABSTRACT

This study addressed the question: Why do parochial school students in Rhode Island tend to perform better than public school students in relation to national norms on the Iowa Tests of Basic Skills (ITBS)? Data for examination of school setting and population factors were collected from interviews with teachers and administrators, a short questionnaire was administered to teachers, and computer tape records of demographic information were collected during the Rhode Island statewide testing program. Data on psychometric and test-intrinsic factors were obtained from the ITBS technical manuals, phone conversations with ITBS author A. N. Hieronymus, and scores from the statewide testing program. A variety of factors were found to contribute to the performance differences. Parochial schools had higher pupil/teacher positive in parochial schools. The curriculum of the parochial schools stressed basic procedures, parental support, and student motivation were more positive in parochial schools. The curriculum of the parochial shcools stressed basic skills while the public school curriculum was more varied. A higher percentage of females attended parochial schools, and parochial students' fathers had higher occupational status. It was also found that differences in ITBS score distributions occurred at the middle and lower end of the distribution, were greatest in the language subtest, and least in mathematics. (Author/BW)

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A COMPREHENSIVE ANALYSIS OF DIFFERENCES IN PUBLIC AND PAROCHIAL SCHOOL STUDENT PERFORMANCE ON STANDARDIZED TESTS OF ACHIEVEMENT

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This paper extracts the principal findings regarding public and parochial school differences from a more extensive work on "Achievement in the Basic Skills: 4th/8th Grade and Public and Parochial Schools." The complete data are presented in the full report.

ABSTRACT

Differences in Public/Parochial School Student Performance
on Standardized Tests of Achievement

Local expression of a national concern resulted in conduct of this study addressing why Rhode Island parochial school students perform better than public on the ITBS. Research covered: psychometric/test intrinsic components (scale attenuation, norming procedures, technical development possibility biasing scoring); school setting (instructional/curricular aspects, policies); student population (ability, socio-economic status, attitude toward school/testing, family influences). Data included state testing reports, demographic records, literature review, test publisher manual/technical report examination, and teacher/administrator interviews. Indications are: 1) differences are real and significant, 2) many factors contribute toward the differences between the schools.

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INTRODUCTION

A group of researchers associated with the University of Rhode Island's Curriculum Research and Development Center undertook a research project to address the question:

> Why do parochial school students in Rhode Island, especially at the eighth grade level, tend to perform better than public school students in relation to national norms on the Iowa Test of Basic Skills?

METHODOLOGY

The examination of the question focused on three areas: school setting factors, population factors, and psychometric/test intrinsic factors. Four data sources were used:

(1) Iowa Test of Basic Skills (ITBS) - examination of the administration, use, and attitudes toward the standardized test;

(2) Parent attitudes - examination of the attitudes of parents toward educational policies of the school, and their interest in their children's education;

(3) Organizational aspects - exploration of the organizational environment within the school including teacher perceptions of students and teacher morale; and

(4) Curriculum and instruction - examination of the curricular and instructional activities undertaken in the school.

Data for examination of the school setting and population factors were collected by two means: interviews with classroom teachers and administrators at building and central administration levels, and a short questionnaire administered to classroom teachers. Schools selected for interviews included two of each of the following in the fourth and eighth grades:

(1) high achieving public
(2) low achieving public
(3) high achieving parochial
(4) low achieving parochial

A semi-structured interview form was developed and field-tested for use in the interview process. For each school selected, at least five classroom teachers from different grade levels, the building administrator, and personnel from the central office administration were interviewed. The short form questionnaire was developed to elicit information in specified areas from the remaining teachers in each school who were not interviewed.

SCHOOL SETTING FACTORS

From an organizational aspect, several differences were noted between public and parochial schools during interviews: Parochial school students missed fewer days of school per year (average 5.6) than public school students (average 9.1). Parochial school teachers are happier with the support and administrative activities in their buildings than are public school teachers. In addition, parochial school teachers perceive disciplinary policy to be more effective in their schools than do public school teachers.

In relation to curriculum and instruction, several more differences were noted: Parochial schools average more minutes of instruction in basic skills each week than public schools. In math instruction, parochial schools average 220 minutes per week while public schools average 193 minutes per week. In reading instruction, parochial schools average 620 minutes of instruction per week and public schools average 465.5 minutes per week.

Public schools engage in a wider variety of academic activities (see Table 1) (e.g., foreign language, science, math, and vocational courses) than parochial schools. Public schools also offer more "special" programs

Table 1

Participation in Special Programs

Program Type	Achievement Level	School Type	Percents of Students Involved	
			Grade 4	Grade 8
Bilingual	High	Public	2%	N.A.
		Parochial	N.A.*	N.A.
	Low	Public	4%	19%
		Parochial	N.A.	N.A.
Special Needs	High	Public	0	1%
		Parochial	N.A.	N.A.
	Low	Public	4%	5%
		Parochial	N.A.	N.A.
Remedial Reading	High	Public	N.A.	31%
		Parochial	N.A.	N.A.
	Low	Public	11%	28%
		Parochial	47%	15%
Remedial Math	High	Public	8%	11%
		Parochial	N.A.	N.A.
	Low	Public	8%	16%
		Parochial	N.A.	29%
Other	High	Public	N.A.	19%
		Parochial	N.A.	N.A.
	Low	Public	7%	N.A.
		Parochial	N.A.	N.A.

* N.A. = Not applicable, indicating no program available in the schools interviewed.

than parochial schools (e.g., special education, remedial math and reading, hearing classes, etc.).

In general, the interview data show that staff members see some important differences between public and parochial students. Public school teachers, particularly in low achieving schools, consistently rate their students as less eager to please, less motivated, less disciplined, less cheerful, less bright, and less interested in school. Parochial teachers rate their students as more cooperative, motivated, disciplined, cheerful, bright and high in school interest.

Findings:

The organizational environment of the parochial school in relation to discipline, teacher-principal relationship, and general climate is more conducive to a positive learning environment.

The curriculum of the parochial school stresses the basic skills area while the public school curriculum is varied and intended to deal with more subject areas.

POPULATION FACTORS

The examination of population factors focused on socioeconomic status and achievement, i.e., examination of the background of students and its relationship to achievement; and on examination of specific demographic variables or selection factors which might affect average student achievement.

Data for examination of the population factors were collected from the interviews with teachers and administrators, responses to the short form questionnaire, and computer tape records of demographic information collected by the Rhode Island Department of Education during a statewide testing program.

With respect to population factors a number of studies were found indicating that SES has been shown to be one of the most useful variables in predicting student achievement. Based upon this information, this research project attempted to ascertain if public school students and parochial school students differed in SES.

In this regard, a higher percentage of parochial school students:

1. were female (fourth and eighth grades)
2. had books in their homes (fourth and eighth grades)
3. had books in their homes they liked to read (fourth and eighth grades)
4. owned library cards (fourth and eighth grades)
5. discussed school with their parents (eighth grades)
6. had parental assistance with school work (fourth grade)
7. had fathers whose occupation was clerical, professional, or managerial or owner (eighth grade)
8. had fathers who attended college (eighth grade)
9. desired to attend college (eighth grade)
10. preferred professional occupations (eighth grade)

Finding:

On the basis of the data for both grades, it appears that a variety of demographic variables may at least contribute to the observed differences in parochial and public school achievement test results.

Information collected in the interviews suggests that no selection factors or entrance requirements to public or parochial schools are evident other than religious affiliation.

Conclusion:

Selection factors or entrance requirements, as imposed by the public or parochial schools, are not variables which can explain differences in ITBS test results.

Interest in demographic data is due to the relationship of socio-economic status to school achievement. All demographic variables in the State testing files for which it was suitable had correlations with ITBS composite grade equivalent score computed. (See Table 2) Although many were statistically significant, all are indications of only slight relationships. In this data, only the number of books in the home was substantially related to grade equivalent scores for both grades.

PSYCHOMETRIC AND TEST-INTRINSIC FACTORS

The examination of the impact of psychometric and test-intrinsic factors upon the analysis and interpretation of the data focused upon the following two areas:

(1) General Scaling Issues - Examination of certain inherent characteristics of the ITBS, its normative information, and various problems associated with making longitudinal comparisons based upon this normative information

(2) Examination of Test Data - Rhode Island's State testing data for 1970-71 and 1974-75 analyzed for public/parochial score differentials for the total score distributions. Prior State reports restricted the examination to simple average scores.

Data were obtained from information in the ITBS technical manuals provided by the Houghton-Mifflin Company; phone conversations with A. N. Hieronymus, the principal author of the ITBS; and the actual scores of all students who participated in the Rhode Island State testing program during the period 1969 to 1975.

Because of the focus of the study, it was deemed desirable to analyze the achievement scores of the same students at both the fourth and eighth grades. The most complete and reliable data set for this purpose was data on students who were fourth graders in 1970-71 and eighth graders in 1974-75.

Table 2

Correlations of Selected Demographic Survey Items with ITBS Composite Grade Equivalent

	Grade 4		Grade 8	
	r*	p**	r*	p**
Item 5 (Number of People in House)	-.14	.001	-.09	.001
Item 7 (Number of Rooms in House)	.17	.001	.14	.001
Item 8 (Availability of Encyclopedia or Dictionary in House)	.22	.001	.10	.001
Item 9 (Availability of Newspapers or Magazines in the House)	.08	.001	.08	.001
Item 10 (Number of Books in the Home)	.26	.001	.26	.001
Item 11 (Student Interest in Books)	.10	.001	.14	.001
Item 12 (Student Possession of a Library Card)	.15	.001	.19	.001
Item 13 (Parent Communication about School)	.10	.001	.18	.001
Item 14 (Parent's Assistance with School Work)	-.09	.001	-.10	.001
Item 16 (Hours Spent Watching TV)	.08	.001	.02	.001
Item 21 (Student's Desire to go to College)	-.10	.001	.26	.001

*Pearson product-movement correlation

**Probability of achieving a r this large by chance

In the examination of fourth to eighth grade achievement score changes it was noted that, for all ITBS subtests at both fourth and eighth grades, parochial school students scored higher than did public school students when both groups were compared to the national norms. This fact should not surprise anyone since, as is noted by the publishers of the ITBS, "In general, performance on the test by pupils in Catholic schools is extremely variable and is considerably above national performance, particularly in the upper grades." The important factor to consider is how to interpret these differences when inferences relative to the performance of the public and parochial schools is the issue. Examination of national and Catholic norms using the ITBS manuals indicates that grade equivalent scores associated with the various percentiles are substantially higher for the Catholic norm sample than for the national norm sample; there is typically a two to three month differential at fourth grade, and a four to eleven month differential at eighth grade. In examining the differences in achievement of the public and parochial school students on the Rhode Island State testing program, therefore, the following sets of analyses were conducted:

a) examination of the test publishers' manuals based on national norms and norms for students in Catholic schools to determine what, if any, national patterns of achievement differences existed; and

b) re-analysis of Rhode Island public and parochial school students' achievement compared with their most appropriate norm group or groups.

The results of these comparisons are given in Tables 3 through 8. Table 3 presents, for each of four test areas, the average grade equivalents and the percentiles associated with these grade equivalents. Since a percentile represents standing within a specified population, the "expected change" from fourth to eighth grade would be 0 -- i.e.,

the expectation would be that the students would neither gain nor lose, but would maintain their relative position in the population. Inspection of Table 3 illustrates that, when change relative to the national norm group is examined, the average public school student decreased slightly (from a loss of between three to seven percentile points) while the average parochial school student increased slightly (from no change to a gain of two percentile points). Further, the average for the public school students started very close to the 50th percentile (the "national average") and ended very close to the national average. On the Composite, or overall score, the change was from the 52nd to the 48th percentile. Parochial school students at the fourth grade level were somewhat above the national average (th 59th percentile) at grade four and improved very slightly (to the 60th percentile) by grade eight.

The data which follow are based on a re-analysis of student test scores from 1970-71 (fourth grade) and 1974-75 (eighth grade). It uses, as its measure of central tendency, the median score rather than the mean score, since: a) percentile scores represent an ordinal scale rather than an internal scale and thus it is not proper to compute a mean; and b) the 50th percentile is, by definition, the median.

Examination of differences in student achievement are based on an examination of not only the differences between scores of the average (median) student, but also between students at other points in the distribution. Thus, the summarized findings which follow use two basic

Table 3

Alternative Longitudinal Comparison (1970-71 to 1974-75)
of the Longitudinal Data presented by RIDE

ITBS Score		4th Grade 1970-71		8th Grade 1974-75		Expected Gain	Actual Gain
		GE	Natl. %ile.	GE	Natl. %ile.	Natl. %ile.	Natl. %ile.
Composite	Public	4.1	52	7.9	48	0	-4
	Parochial	4.3	59	8.5	60	0	+1
Reading	Public	4.0	48	7.8	45	0	-3
	Parochial	4.3	56	8.5	57	0	+1
Total Language	Public	4.2	54	7.8	47	0	-7
	Parochial	4.6	63	8.8	63	0	0
Total Mathematics	Public	4.1	52	7.9	48	0	-4
	Parochial	4.1	52	8.2	54	0	+2

methods of analysis:

1) statistical tests of significance for differences in cumulative frequency distributions at fourth and eighth grades based on national percentile norms and

2) an examination of student scores at three critical points in the distribution: the 25th, 50th, and 75th percentiles based on Rhode Island scores.

Examination of the 25th, 50th, and 75th percentiles (Tables 4 and 5) of the fourth and eighth grade achievement scores for public and parocnial school students simply corroborated the findings relative to the total score distribution -- i.e., when national percentile norms are the common reference point for gauging achievement score changes for public and parochial schools, public schools demonstrate a slight "slippage" relative to the national population while parochial schools demonstrate a slight increase in their standing relative to the national population. It should be noted that although the differences in total score distributions were statistically significant the actual net amount of losses or gains made were quite small.

Table 6 presents, for each of four ITBS test areas the percentile ranks associated with the "average" public and parochial school student. For the public school students a single percentile rank, obtained from the national norms tables, is presented. For the parochial school fourth grades, however, <u>two</u> percentile ranks are presented--Parochial (1), obtained from the national norms table and Parochial (2), obtained from

Table 4

Fourth to Eighth Grade Achievement Changes,
Public School Student, Composite

	Fourth Grade		Eighth Grade	
	G.E.	National Percentile	G.E.	National Percentile
P75	4.9	76	9.0	70
P50	4.2	56	7.8	46
P25	3.5	33	6.7	26

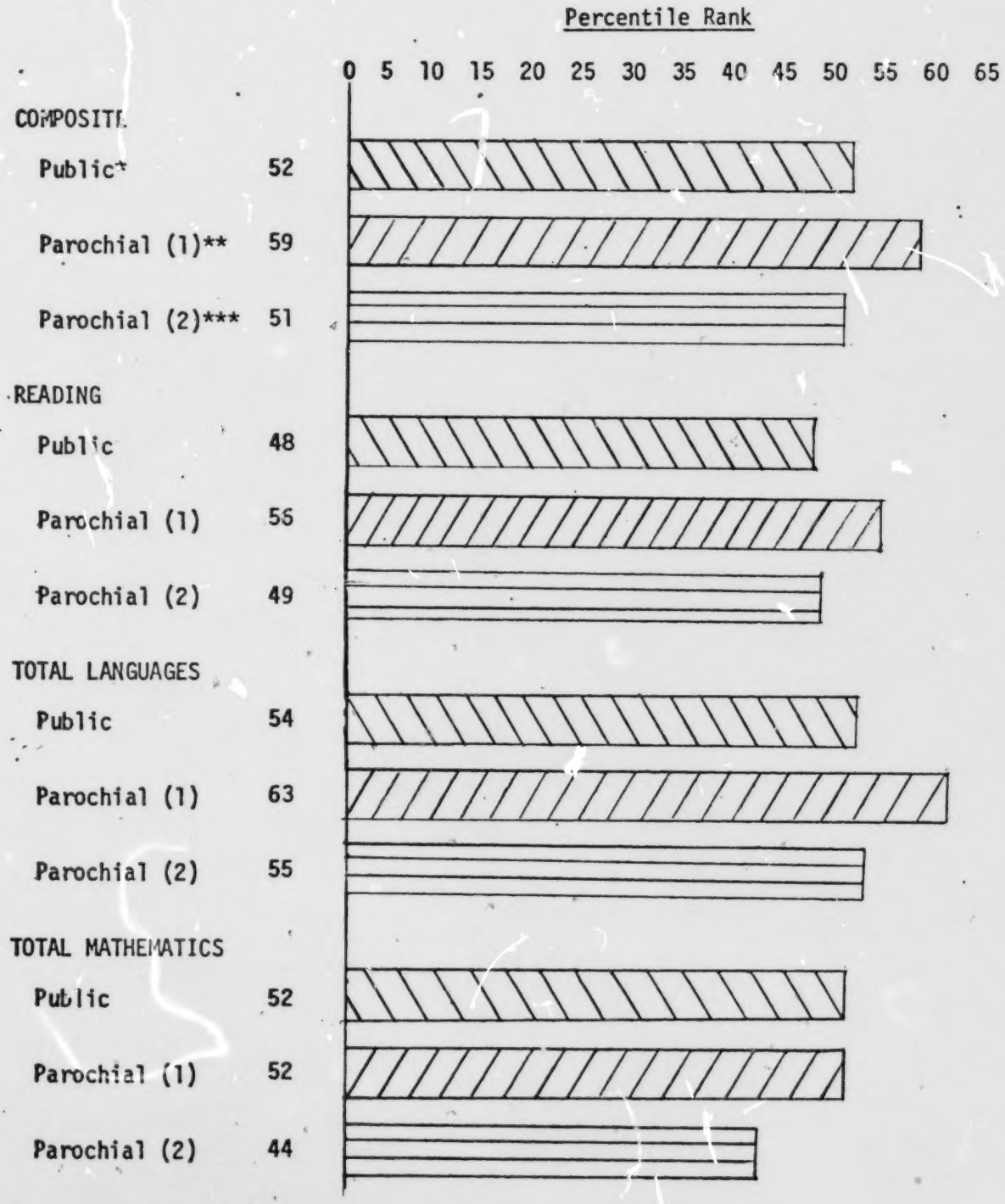
Table 5

Fourth to Eighth Grade Achievement Changes,
Parochial School Student, Composite

	Fourth Grade		Eighth Grade	
	G.E.	National Percentile	G.E.	National Percentile
P75	4.9	76	10.0	77
P50	4.3	59	8.9	60
P25	3.7	40	7.5	40

Table 6

ITBS Achievement of Fourth Graders by Type of School
(1970-71)



*: Public: Using National Norms Tables
**: Parochial (1): Using National Norms Tables
***: Parochial (2): Using Catholic School Norms Tables

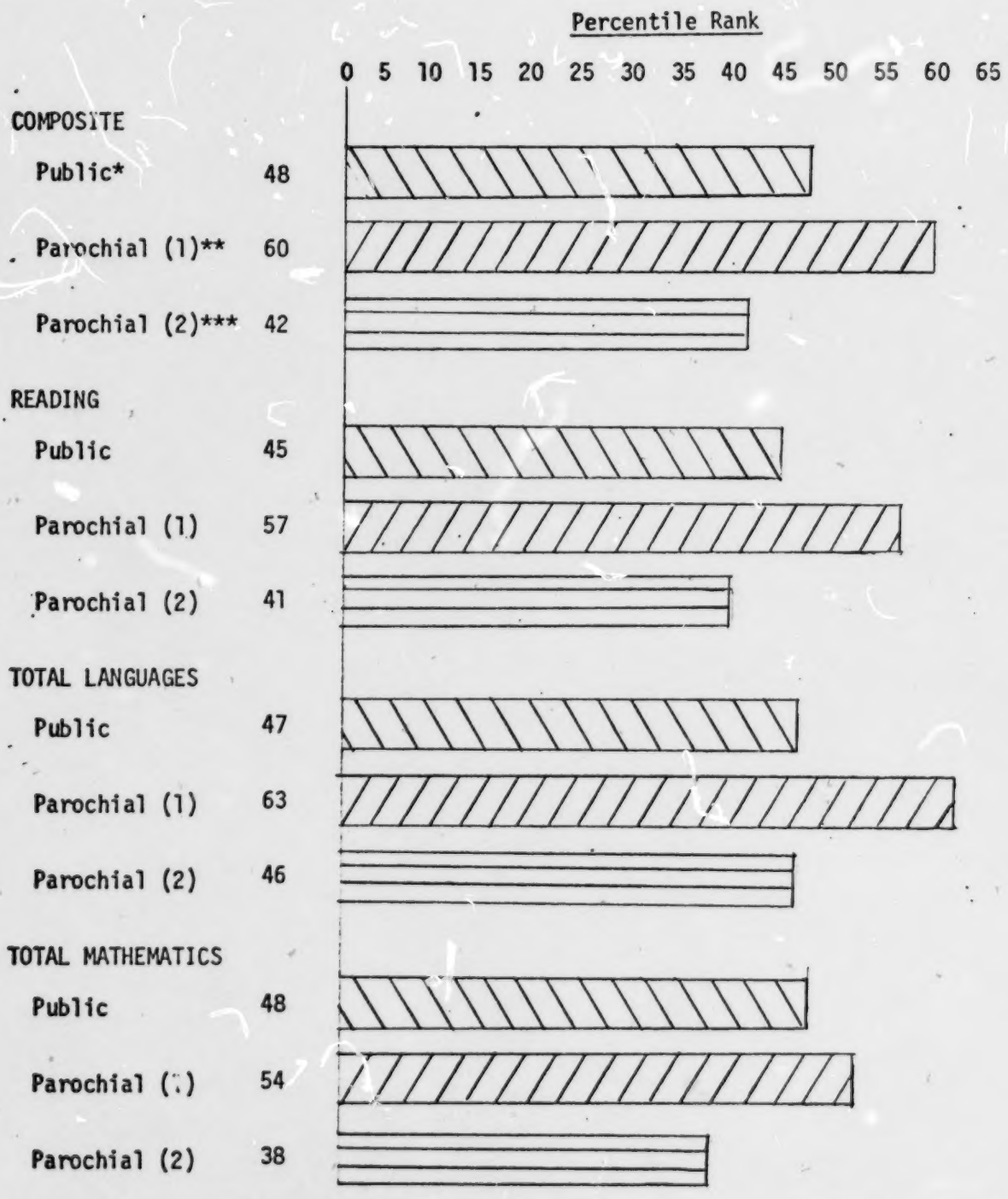
the norms table for Catholic schools. As inspection of Table 6 illustrates, the percentile for the average fourth grade public school student is below the percentile for the average fourth grade parochial student [parochial (1)] when both are compared to national norms. When the parochial school students are compared to what is perhaps a more appropriate reference group, the Catholic school norms, a somewhat different picture emerges. Comparing performance of public with parochial (2) indicates that when the public and parochial schools are compared, each to their most comparable reference group, their respective achievement relative to these groups is very close--on the ITBS Composite score the percentile ranks are 52 and 51 for the public and parochial schools, respectively.

Table 7 presents a similar picture at grade eight. As was the case at grade four, the absolute achievement level of the parochial school students exceeds that of the public school students when both are compared to the national norms [Public vs. Parochial (1)]. When comparisons are made vis a vis their more comparable reference group, however, a different picture emerges. While the public school students remain quite close to the center of their reference group (composite score percentile = 48) the parochial school students score moderately below the center of their (Catholic schools) reference group (composite score percentile rank = 42).

Finally, Table 8 displays achievement score changes from fourth to eighth grade for public and parochial school students, where changes are defined in terms of gains or losses in standing relative to one's norm group. As can be seen in Table 6 there are small to moderate decreases in Rhode Island public school students' standing relative to

Table 7

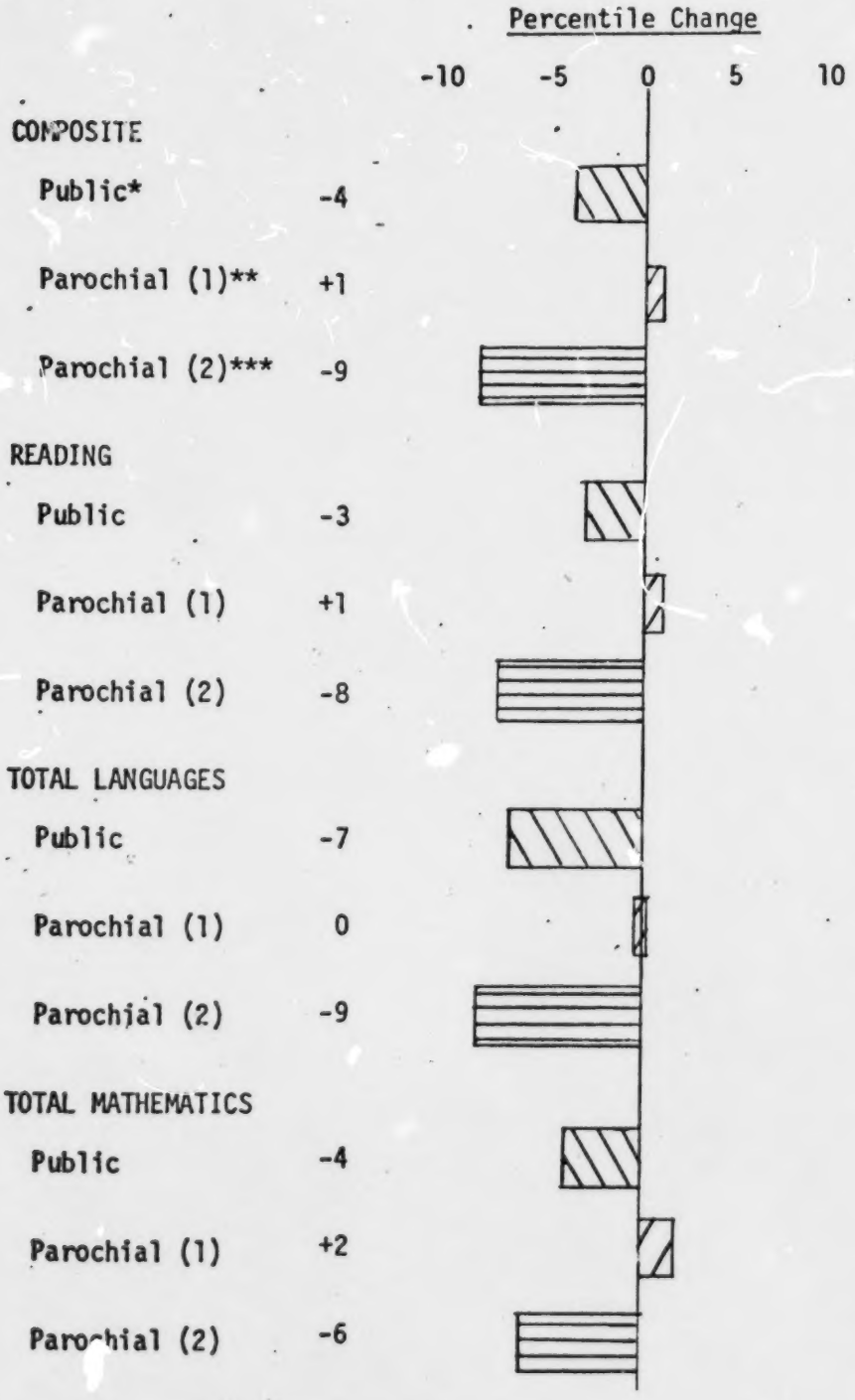
ITBS Achievement of Eighth Graders by Type of School
(1974-75)



*: Public: Using National Norms Tables
**: Parochial (1): Using National Norms Tables
***: Parochial (2): Using Catholic School Norms Tables

Table 8

Fourth to Eighth Grade ITBS Achievement Changes by Type of School



*: Public: Using National Norms Tables
**: Parochial (1): Using National Norms Tables
***: Parochial (2): Using Catholic School Norms Tables

the national norms between fourth and eighth grades (losses range from three percentile points in Reading to seven percentile points in total Language). When Rhode Island parochial school student changes are examined relative to national norms [Parochial (1)] it can be seen that these changes range from no change on the total Language score to a gain of two percentile points on the total Mathematics score. When Rhode Island parochial school student scores are compared to the norms for Catholic schools [Parochial (2)] it can be seen that moderate decreases occur in percentile standing (losses range from six percentile points in Total Mathematics to nine percentile points on Total Language and the Composite Score).

SUMMARY

This investigation was undertaken to determine what factors might contribute to differences in student scores on the Iowa Test of Basic Skills between public and parochial schools. The design of the study was primarily that of descriptive data collection and reporting. The following differences have been identified.

In the area of school setting factors:

a. The amount of time spent in direct instruction of basic skills was greater in parochial schools where more time was spent teaching math and reading than public schools;

b. Parochial schools have higher pupil/teacher ratios than public schools;

c. The number of student absences for public school students was greater than for the parochial students;

d. Parochial teachers felt discipline procedures in their school were more effective than did the public school teachers'.

In the area of population factors:

a. A difference in the percent of female students attending the parochial, as compared to the public, schools;

b. Differing teacher perceptions of parental support in the public and in the parochial settings;

c. Differing teacher perceptions of student motivational variables in the public and in the parochial settings; and

d. Differences in the reported father's occupational status of parochial and public school students.

Finally, in the Psychometric/Test Intrinsic area:

a. In relation to National norms, there are significant differences between the ITBS achievement test score distributions of public and parochial school students; in relation to National norms, these differences are larger at the eighth grade than at the fourth grade.

b. In general, differences in ITBS score distributions based on National norms occur at the middle and lower end of the distribution. There are no substantial differences in achievement between public and parochial school students who score at the top of their respective distributions.

c. Differences in achievement between public and parochial school students are greatest in the subtest area of Language and least in the subtest area of Mathematics.